

# PATENT ABSTRACTS OF JAPAN

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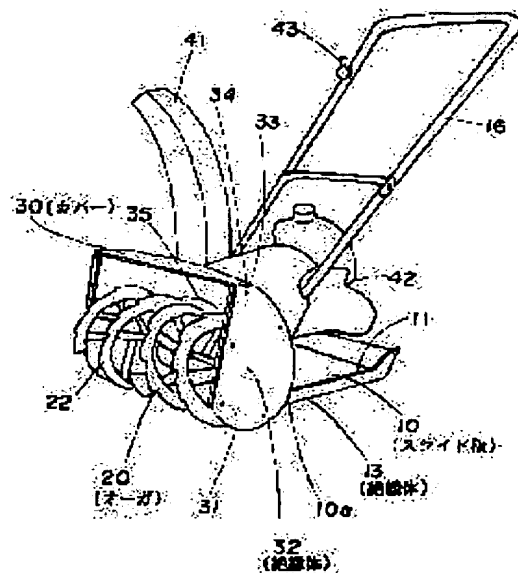
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## (54) SMALL-SIZED SNOW REMOVING MACHINE

### (57)Abstract:

**PURPOSE:** To enhance the safety through provision of mobility so that it does not influence the place with railroad rails, etc., where risk of electrical shortcircuiting exists and also equip the function to well work with a hardened or frozen snow to ensure enhancement of the snow removing ability.

**CONSTITUTION:** A small-sized snow removing machine is equipped with a slide plate 10 capable of advancing while sliding on a snow surface, an auger 20 which rotates on the slide plate 10 and scratches in the snow deposited ahead in the slide plate advancing direction, and a cover 30 which covers the auger 20, whereby the snow raked in by the auger 20 is scattered away, and thus the snow removal is accomplished, wherein the sliding face 10a of the slide plate 10 is made of an electrically insulative material 13 while the side face 31 of the cover 30 located extremely aside is formed from electrically insulative material 32. Spiral vanes 22 are provided on the auger 20 protrusively ahead of the front edge and also downward from the sliding face 10a so that the vanes 22 contact the snow surface.



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**CLAIMS**

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[Claim(s)]

[Claim 1] The small snowblower carry out having formed with an insulator the front face of the member touch to the snow surface which includes in the slide side of a slide plate at least in the small snowblower which slides a snow surface, and the slide plate which can run, the auger which is formed pivotable on this slide plate, is rotated, and bolt the snow of the travelling direction anteposition of a slide plate, and the above-mentioned auger disperse out of covering of the snow which was equipped with wrap covering and bolted with the above-mentioned auger, and removes the snow from them as the description.

[Claim 2] The small snowblower according to claim 1 characterized by forming with an insulator the front face of the member most located in the side.

[Claim 3] The small snowblower according to claim 1 or 2 characterized by making the spiral wing of this auger project to a front [ first transition / of the above-mentioned slide plate ] side so that the spiral wing of the above-mentioned auger may touch a snow surface.

[Claim 4] The small snowblower according to claim 3 characterized by making the spiral wing of the above-mentioned auger project below the slide side of the above-mentioned slide plate.

[Claim 5] The small snowblower according to claim 3 or 4 characterized by having joined two metal plates and forming the spiral wing of the above-mentioned auger.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the so-called camber type which snow is bolted, and this bolted snow is dispersed and removes the snow with an auger of small snowblower, starting a small snowblower and making a snow surface slide especially.

[0002]

[Description of the Prior Art] Conventionally, as this kind of a small snowblower, the thing as shown in drawing 9 is known, for example. This small snowblower slides a snow surface. The iron slide plate 1 which can run, The handle 2 for pushing the slide plate 1, and the auger 4 which the spiral wing 3 is had and rotated and bolts snow while being prepared pivotable on the slide plate 1, It has the iron covering 5 which puts on low wall 5b which has opening 5a in a before side, covers the auger 4 whole, and is located in the auger 4 bottom in snow by advance of the slide plate 1, and is led to an auger 4. It leads to inlet 5c which prepared the snow bolted by the auger 4 in covering 5, and he rotates an internal scattering wing (not shown), and is trying to make it disperse out of covering 5. The guidance cylinder which a sign 7 guides the snow which disperses by the scattering wing, and regulates the scattering direction, and 8 are drives which are made to rotate the above-mentioned auger 4 and a scattering wing and which consist of a gasoline engine of a two cycle, for example among drawing 9.

[0003] When using this small snowblower, for example, if it explains by the case where it uses when removing the snow from the construction section of Rail R, or its flank in the site of the railroad where Rail R was laid, as shown in drawing 10, first, a drive 8 will be made to drive and a handle 2 will be advanced in the direction which is made to slide push and the slide plate 1 and meets Rail R. Snow is incorporated in covering 5 during this advance, this snow is bolted to inlet 5c of covering 5 with an auger 4, and it is made to disperse through the guidance cylinder 7 by the scattering wing. And the snow is removed by making it move in the direction which changes the direction of a small snowblower one by one, and meets Rail R.

[0004]

[Problem(s) to be Solved by the Invention] Generally by the way, on the rail R in the site of a railroad For example, as there are some which are being operated as circuits for various kinds of signal transduction, such as a track concerning a crossing and a track with a turnout, for example, it is shown in drawing 11. When a car straddles the rail R of Nijo (drawing 11 a), or when the wheel of a car straddles joint Ra of Rail R (drawing 11 b), he passes a current and is trying to take out as a signal.

[0005] However, if it is in the conventional small snowblower mentioned above Since the slide plate 1 and covering 5 are iron, when moving a small snowblower ranging over Rail R As shown in drawing 11 and drawing 12, it is built over the slide plate 1 between Rails R, or joint Ra is built. Or while removing the snow along with Rail R, it is built over the slide plate 1 or covering 5 in contact with joint Ra of Rail R, and Rail R is short-circuited, the abnormality signal was generated, trouble may be caused and there was a problem of not being desirable on insurance.

[0006] Moreover, since he is trying to bolt with an auger 4 in the case of snow removal after putting snow on low wall 5b of covering 5 In the case of comparatively soft snow, it is good, but by solidifying to some extent, case [ like hardened snow in becoming common eye-like or freezing ] Snow could not be dipped up by low wall 5b of covering 5, but there was also a problem that the snow might be unable to be substantially removed only by the slide plate 1 sliding on a snow surface.

[0007] This invention was made in view of the above-mentioned trouble, and it enables it to move it in the first place so that a place with a possibility that the electric short circuit of the rail of a railroad etc. may arise may not be affected, and, in the first place, it aims at offering the small snowblower which aimed at

improvement in safety. Moreover, it enables it to correspond to the second also to the snow which became hard or was frozen, and aims at the point of aiming at improvement in snow removal capacity. And it made to aim at improvement in operability, and improvement in the reinforcement of equipment into the technical problem if needed.

[0008]

[Means for Solving the Problem] In order to attain the first purpose of the above the technical means of this invention The auger which slides a snow surface, is formed pivotable on the slide plate which can run, and this slide plate, is rotated, and bolts the snow of the travelling direction anteposition of a slide plate, In the small snowblower which the above-mentioned auger is dispersed out of covering of the snow which was equipped with wrap covering and bolted with the above-mentioned auger, and removes the snow from it, the front face of the member which touches the snow surface which includes the slide side of a slide plate at least is formed with an insulator. And the front face of the member most located in the side is formed with the insulator if needed.

[0009] Moreover, in order to attain the second purpose in addition to the first purpose of the above, the technical means of this invention make the spiral wing of this auger in addition to the above-mentioned configuration, project to a front [ first transition / of the above-mentioned slide plate ] side so that the spiral wing of the above-mentioned auger may touch a snow surface. And it is considering as the configuration which made the spiral wing of the above-mentioned auger project below the slide side of the above-mentioned slide plate if needed.

[0010] And it is effective to have joined two metal plates and to have formed the spiral wing of the above-mentioned auger again.

[0011]

[Function] If it is made to go on by making a slide plate slide according to the small snowblower which consists of such a configuration, rotating an auger, an auger bolts snow, and the bolted snow is dispersed out of covering and the snow is removed from it. In this case, since the front face of the member which touches the snow surface which includes the slide side of a slide plate at least is formed with the insulator even if there is a place which has a possibility that the electric short circuit of the rail of a railroad etc. may arise in a snow removal part, even if these members touch an applicable part, the situation to short-circuit is prevented and safety is secured. Moreover, when the front face of the member most located in the side is formed with an insulator, even if these members touch an applicable part, the situation to short-circuit is prevented and safety is secured much more certainly.

[0012] And when the spiral wing of this auger is made to project to a front [ first transition / of the above-mentioned slide plate ] side so that the spiral wing of the above-mentioned auger may touch a snow surface, since the snow on which the auger piled up will be bolted directly and an opportunity to touch snow so much increases, the snowy amount of incorporation is increased. Moreover, even when snow solidified, and it becomes common eye-like or has frozen, this can be broken, therefore snow removal is ensured.

[0013] Furthermore, when the spiral wing of the above-mentioned auger is made to project below the slide side of the above-mentioned slide plate, an auger can be made to be able to contact a snow surface certainly at the time of the slide of a slide plate, snow can be bolted, and a snow removal function is raised so much. Furthermore, an auger will function also as a wheel and advance of a slide plate is performed easily.

[0014] And even when it became a thing strong in reinforcement again when two metal plates are joined and the spiral wing of the above-mentioned auger is formed, and snow solidified, and it becomes common eye-like or has frozen, it is hard to be damaged and the situation which causes trouble to a function is prevented.

[0015]

[Example] Hereafter, based on an accompanying drawing, the small snowblower concerning the example of this invention is explained to a detail. In the small snowblower shown in drawing 1 thru/or drawing 5 , 10 slides a snow surface and is the slide plate which can run. As shown in drawing 4 , the slide plate 10 is formed in the configuration which made the before [ a rectangle plate ] side extend, and as shown in drawing 1 , the side plate section 11 starts and it is formed in the side edge. Moreover, as shown in drawing 6 , the slide plate 10 joins the insulator 13 which becomes the iron plate manufacturing 12 from FRP (fiber reinforced plastics) plate manufacturing, and fixes and consists of rivets 14. That is, slide side 10a of the slide plate 10 and side plate section 11 outside are covered with the insulator 13. Coating of the FRP material 15 is carried out to 14 rivets.

[0016] 16 is a handle for pushing the slide plate 10, and is being fixed to the slide plate 10 bottom through the supporter material 17. \*\*\*\* of this handle 16 has become possible, and at the time of \*\*\*\*, it uses the whole as a compact and is enabling loading of it in the trunk of an automobile etc.

[0017] 20 is an auger which bolts the snow of the travelling direction anteposition of the slide plate 10. This auger 20 is equipped with the revolving shaft 21 which intersects perpendicularly with the travelling direction of the slide plate 10, and two or more spiral wings 22 prepared in this revolving shaft 21. The revolving shaft 21 is supported to revolve pivotable by the bearing member 23 to which the both ends extend from the above-mentioned supporter material 17. 24 is the gearbox prepared in the center of a revolving shaft 21, and builds in the worm and worm gearing which transmit rotation of the rotation shaft 25 to which it is rotated by the below-mentioned drive, and an axis meets the travelling direction of the slide plate 10 to this revolving shaft 21, and are made to rotate this.

[0018] As shown in drawing 2, the spiral wing 22 is formed in the shape of abbreviation for S characters, and is prepared in right and left of a gearbox 24 the pair every, respectively. Mutually, the spiral directions of torsion differ, and the spiral wing 22 on either side is constituted so that the snow bolted towards the gearbox 24 side by rotation of a revolving shaft 21 may be completed. As shown in drawing 7 and drawing 8, two metal plates 20a and 20b are joined, and the spiral wing 22 is formed, and is formed in the conventional wing twice the thickness of a spiral. Moreover, two or more steps 26 are formed in a periphery, and the spiral wing 22 is formed in serrate [ coarse ]. Each spiral wing 22 is reinforced with the reinforcing rib 28 prepared between these ribs 27 while being fixed to the revolving shaft 21 with four ribs 27, respectively.

[0019] And these spiral wings 22 are made to project so that a snow surface may be touched by the front [ first transition / 18 / of the above-mentioned slide plate 10 ] side, and only L is made to project at them rather than slide side 10a of the above-mentioned slide plate 10, as shown in drawing 5 by the bottom (an example about L= 1cm).

[0020] 30 is wrap covering about the upper part, posterior part, and flank of an auger 20. The side face 31 of this covering 30 is the front face of a projection and the member most located in the side from the side plate of the slide plate 10 in the side. Moreover, this covering 30 forms iron plate manufacturing in a necessary configuration, and the insulator 32 which consists of FRP plate manufacturing is being fixed to the iron plate manufacturing of the side face 31 of covering 30 by the rivet 33. Coating of the FRP material 34 is carried out to 33 rivets like the above-mentioned slide plate 10. Moreover, as shown in drawing 5, the snow induction room 35 which the snow bolted by the auger 20 enters is established in the part which counters the above-mentioned gearbox 24 of this covering 30.

[0021] 40 is the scattering wing of the rotary mold which disperses the snow which entered the snow induction room 35 of covering 30 out of covering 30, is prepared in the middle of the above-mentioned rotation shaft 25, and is made to carry out a rotation drive, as shown in drawing 5 by rotation of this rotation shaft 25. 41 is formed successively by the snow induction room 35 and is a guidance cylinder which is caused, guides the dispersing snow and regulates the scattering direction scattering wing 40. This guidance cylinder 41 is formed possible [ justification ] to the snow induction room 35 so that the sense of that outlet may be changed.

[0022] 42 is a drive which is made to rotate the above-mentioned rotation shaft 25, and is made to rotate an auger 20 and the scattering wing 40. This drive 42 consists of gasoline engines of a two cycle. It enables it for actuation of the switch 43 ( drawing 1 ) which clutch equipment (not shown) was formed in the middle of the rotation shaft 25, and was formed in the above-mentioned handle 16 to perform the enter end of the power transfer with the rotation shaft 25 and a drive 42.

[0023] Therefore, it is as follows, when using the small snowblower concerning this example, for example, when it explains by the case where it uses when removing the snow from the construction section of Rail R, or its flank in the site of the railroad where Rail R was laid, as shown in drawing 10. First, a drive 42 is made to drive and it is made to go on in the direction which is made to rotate the rotation shaft 25 timely, is made to slide the slide plate 10, and meets Rail R by actuation of a switch 43. In this case, the snow is removed by making it move in the direction which changes the direction of a small snowblower suitably and meets Rail R. Thereby, snow is bolted by the auger 20 and introduced to the snow induction room 35. The snow introduced to the snow induction room 35 is depended scattering wing 40, and disperses through the guidance cylinder 41.

[0024] In this case, since the spiral wing 22 of an auger 20 is made to project so that a snow surface may be touched by the front [ first transition / 18 / of the slide plate 10 ] side and it is made to project below slide side 10a of the slide plate 10 In the lying snow, direct will be bolted, the amount incorporated as compared with the case where it bolts after putting on covering once like before, since an opportunity to touch snow so much increases increases, and snow removal capacity is raised sharply.

[0025] Moreover, since the spiral wing 22 of an auger 20 contacts direct snow and the spiral wing 22 is

formed in serrate, even when snow solidified, and it becomes common eye-like or has frozen, this can be broken, therefore the snow can be removed certainly. Since especially the spiral wing 22 is made to project below slide side 10a of the slide plate 10, at the time of the slide of the slide plate 10, in contact with a snow surface, snow can be bolted certainly, and a snow removal function is raised so much. According to the experiment, by the conventional type, when the thickness of the front face of the frozen snow exceeded 1cm, snow removal was almost difficult, but with the snowblower of this example, even if the thickness of the front face of the frozen snow exceeded 1cm, it checked shaving this off and removing the snow.

[0026] Furthermore, since it will function also as a wheel since the spiral wing 22 is made to project below slide side 10a of the slide plate 10, therefore the hand-pushed force can be assisted, so much, advance of the slide plate 10 can be made easy and operability is raised. Especially, when [ of snow ] few, snow removal is performed very efficiently from the ability of migration to be made quick.

[0027] Furthermore, the situation which is a thing strong in reinforcement since it is reinforced with the reinforcing rib 28 as two metal plates 20a and 20b are joined, and it is formed as the spiral wing 22 is shown in drawing 8 (b), although the resistance which joins an auger 20 in snow removal of the snow frozen in this way [ again ] becomes large, and further shown in drawing 7, is hard to damage, and causes trouble to a function is prevented. Moreover, endurance is raised so much. In addition, the thickness of the snow of snow removal moves a handle 16 up and down, and changes the location of an auger 20, for example, when snow is soft, it is made to make an auger 20 hidden in snow, and when hard, it should just adjust making it shallow etc. according to snow quality suitably.

[0028] In the case of this snow removal, as shown in drawing 2 and drawing 3, and the side face 31 of the covering 30 projected to the slide plate 10 or the side When built in contact with joint Ra of Rail R (refer to drawing 11), even if Rail R is operated as a circuit for various kinds of signal transduction Since slide side 10a of the slide plate 10 is formed with the insulator 13 which consists of FRP plate manufacturing and the side face 31 of covering 30 is formed with the insulator 32 which consists of FRP plate manufacturing Rail R is not short-circuited, therefore an abnormality signal is generated, and the situation which causes trouble is prevented.

[0029] Moreover, in case a small snowblower is moved ranging over Rail R, as shown in drawing 5 As it is built over the slide plate 10 between Rails R or is shown in drawing 3 Since slide side 10a of the slide plate 10 is formed with the insulator 13 which consists of FRP plate manufacturing even if Rail R is operated as a circuit for various kinds of signal transduction when joint Ra is built Rail R is not short-circuited, therefore an abnormality signal is generated, and the situation which causes trouble is prevented.

[0030] In addition, in the above-mentioned example, although FRP plate manufacturing was joined to the slide plate 10 or covering 30, it is not necessarily limited to this, and what fabricated the slide plate 10 and the covering 30 whole only by FRP may be used, and FRP is not coated or it does not interfere [ it changes into the slide plate 10 or the covering 30 whole suitably, and ] with them. Moreover, as an insulator, no matter what insulating materials [, such as not only the above-mentioned FRP but other plastics, rubber, etc. ] it may use, it does not interfere. Moreover, you may change suitably not only in what was mentioned above also about the configuration of the slide plate 10 or covering 30 grade. Furthermore, of course, an insulator may be given to parts other than the above-mentioned part.

[0031] In addition, although explained by the case where it uses when removing the snow in the above-mentioned example again in the site of the railroad where Rail R was laid, it is not necessarily limited to this, and no matter it may use in what places, such as a general foot walk, it does not interfere. Especially, since it is lightweight as compared with a caterpillar-type snowblower, it is made to move to the slope of the flank of a track etc. easily, the snow can be removed, and it becomes very convenient. Also in this case, since the side face 31 of the slide plate 10 and covering 30 is insulated, even if it contacts the part which takes out an electrical signal, the situation of giving trouble is prevented, and correspondence can be certainly done to \*\*\*\* of a road surface, or frazil.

[0032]

[Effect of the Invention] As explained above, even if it uses it in the site of a place with a possibility that an electric short circuit may arise by contact of a slide plate, for example, the railroad where the rail was laid, according to the small snowblower of this invention Since the front face of the member which touches the snow surface which includes the slide side of a slide plate at least was formed with the insulator Making it connect too hastily with a slide plate etc. can be lost, therefore the situation which causes the trouble of generating an abnormality signal can be prevented, and improvement in safety can be aimed at.

[0033] Moreover, when the front face of the member most located in the side is formed with an insulator, a short circuit with a possibility that an electric short circuit may arise by contact of the member concerned

can be prevented, therefore the situation which causes the trouble of generating an abnormality signal can be prevented, and improvement in safety can be aimed at further.

[0034] And when the spiral wing of an auger is made to project to a front [ first transition / of a slide plate ] side, direct can be bolted for the lying snow, the snowy amount of incorporation can increase as compared with the case where it bolts once it puts on covering like before since an opportunity to touch snow so much increases, and snow removal capacity can be raised sharply. Moreover, snow can solidify, it can become common eye-like or can freeze, or case [ like hardened snow ], this can be broken, therefore the snow can be removed certainly, and snow removal capacity can be sharply raised also at this point.

[0035] Moreover, when the spiral wing of an auger is made to project below the slide side of the above-mentioned slide plate, while this can be certainly bolted in contact with a snow surface and a snow removal function improves so much at the time of the slide of a slide plate, correspondence can be certainly done to \*\*\*\* or frazil and snow removal capacity can be raised further. Furthermore, an auger will function also as a wheel, therefore advance of a slide plate can be made easy, and operability can be raised.

[0036] And even if the resistance which joins an auger at the time of snow removal of the frozen snow etc. becomes large since it becomes a thing strong in reinforcement when two metal plates are joined and the spiral wing of an auger is formed again, endurance can be raised while being able to prevent the situation which can make it hard to damage and causes trouble to a function.

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[Translation done.]

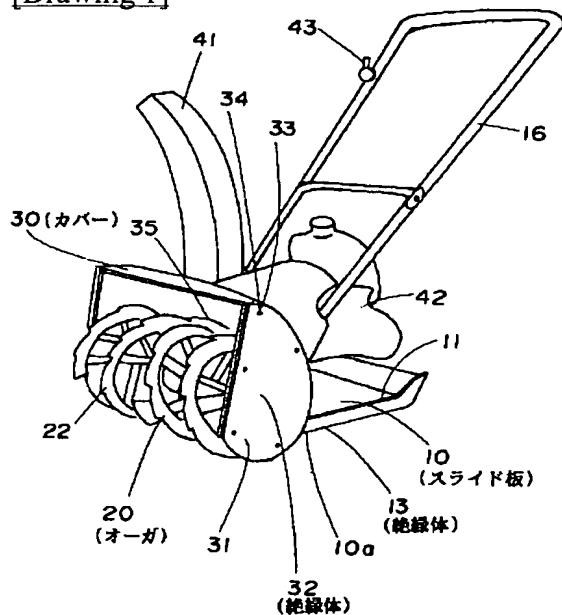
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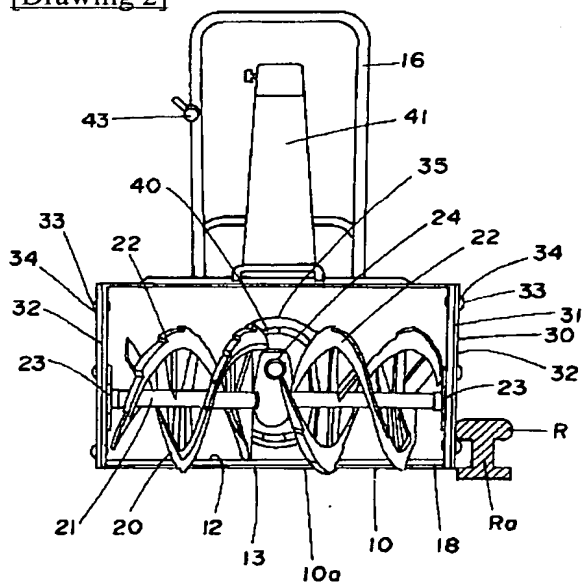
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## DRAWINGS

[Drawing 1]

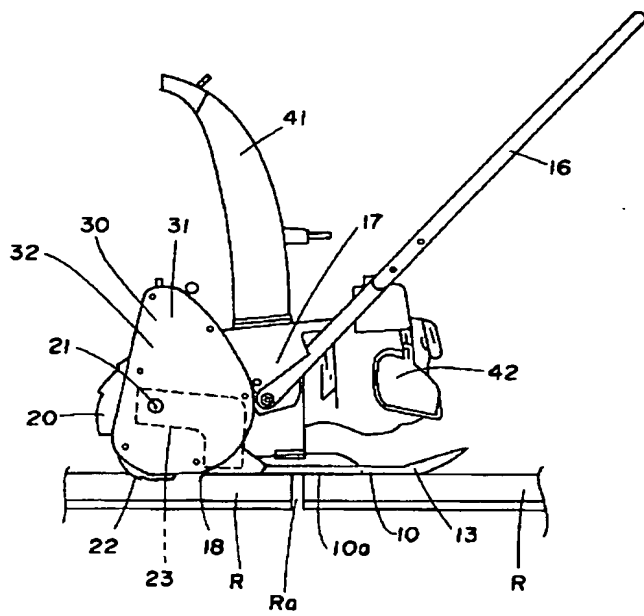


[Drawing 2]

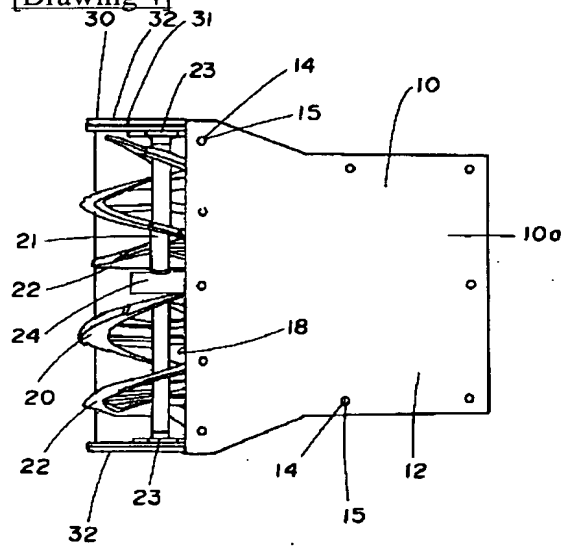


[Drawing 3]

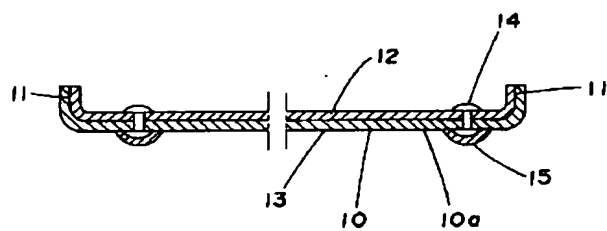




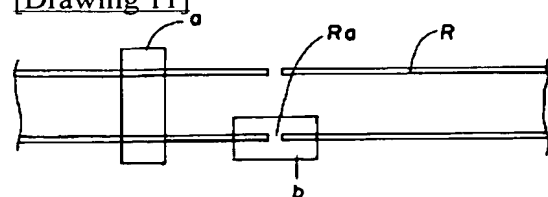
[Drawing 4]



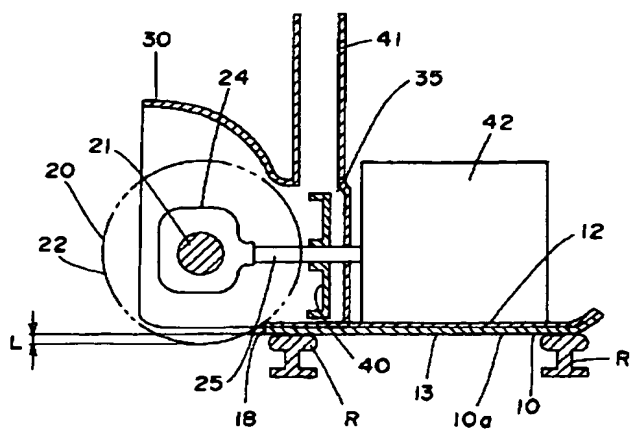
[Drawing 6]



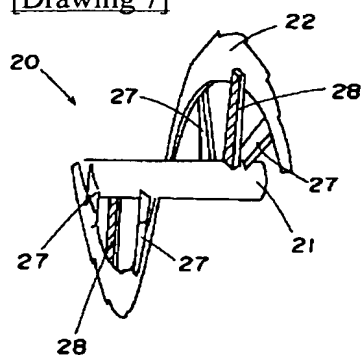
[Drawing 11]



[Drawing 5]

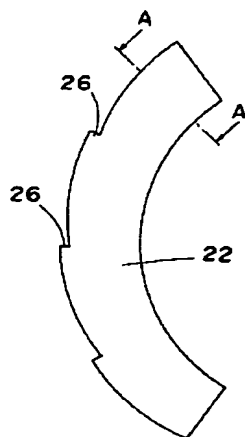


[Drawing 7]

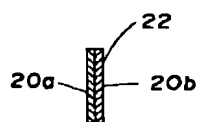


[Drawing 8]

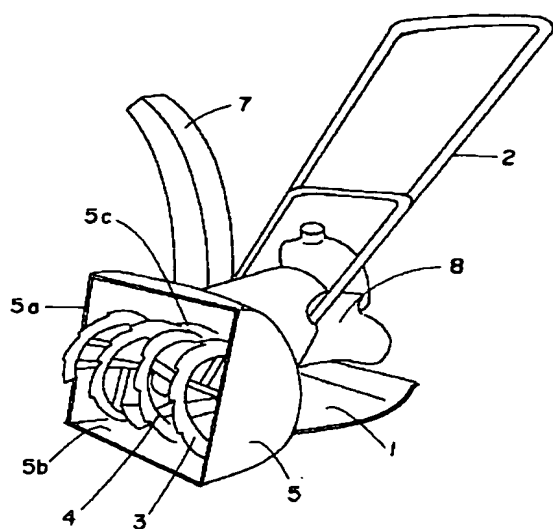
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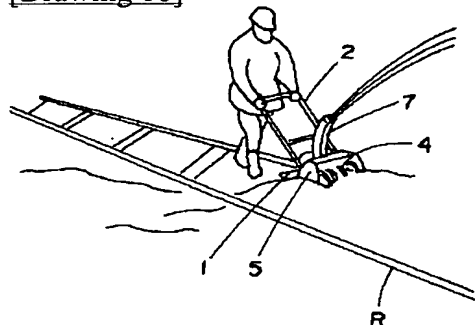
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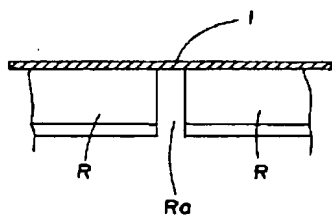
[Drawing 9]



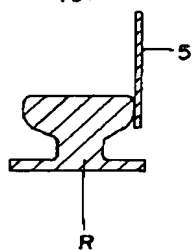
[Drawing 10]



[Drawing 12]  
(a)



(b)



[Translation done.]